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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/511,699

## Applicant(s)

DOI ET AL.

## Examiner

KIMBERLY K. MCCLELLAND

## Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09/03/08.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 36 and 38-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36 and 38-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant is reminded they need to explicitly point out where support for all the newly claimed features comes from as required by MPEP 714.02 and 2163.06. See 37 CFR 1.111.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 36, 38-39, 41-43, 45, and 47-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Publication No. WO02/084631 as evidenced by corresponding U.S. Patent No. 6,872,635 to Hayashi et al. in view of U.S. Patent No. 5,426,342 to Nakamura et al. and U.S. Patent No. 6,613,610 to Iwafuchi et al.

4. With respect to claim 36, Hayashi et al. discloses embedding a plurality of first devices (8) into an uncured adhesive layer (7) provided on a first substrate (6); embedding a plurality of second devices (3) arranged on a second substrate into an uncured adhesive layer (7) provided on the first substrate (6) by positioning the first and second substrates in close proximity thereof such that the plurality of second devices arranged on the second substrate penetrate the surface of the uncured pressure sensitive adhesive layer (See paragraph 0126); and stripping the plurality of second

devices from the first substrate thereby holding the other-side devices in an embedded states in the uncured adhesive layer (See Figures 1-25) wherein the first devices and second devices are light emitting diodes having different characteristics (See paragraph 0170). Hayashi et al. discloses stripping the second substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the plurality of second devices from the second substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

5. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

6. Iwafuchi et al. discloses a similar device transfer method, including a specific recitation of curing the adhesive surface of the transfer substrate after devices have been transferred (column 27, lines 40-45; column 31, lines 54-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the sequence of steps taught in Iwafuchi et al. of transferring the devices prior to

heat/light curing the adhesive layer in the method of Hayashi et al. The motivation would have been to improve ease of separation between the first and second substrate. It would have been obvious to use a known sequence of device transfer to improve a similar method, by allowing for clean removal of the second substrate from the second substrate in the same way. The combination of prior art elements of a sequence of the stripping of a second substrate and curing an adhesive layer used in a device transfer method would have yielded the predictable result of transferring devices from a second substrate to a first substrate without damaging the devices.

7. As to claim 38, Hayashi et al. discloses the one-side (8) devices and the plurality of first devices (3a) and the plurality of second devices are held in the embedded state in different areas on the substrate (See Figures 1-25).

8. As to claim 39, Hayashi et al. discloses embedding devices (42) arranged on a first substrate (41) into an uncured pressure sensitive adhesive layer (45) provided on a second substrate (43) by positioning the first and second substrates in close proximity thereof such that the devices arranged on the first substrate penetrate the surface of the uncured pressure sensitive adhesive layer, the pressure sensitive adhesive being in an uncured state (See Figures 1-25); wherein the devices are light emitting diodes (See paragraph 0170); stripping the devices from the first substrate thereby holding the devices in an embedded state in the pressure sensitive adhesive layer (See Figures 1-25), and hardening the uncured adhesive layer to cure the pressure sensitive adhesive (See paragraph 0226); forming first electric wirings (46) on the adhesive layer, adhering a third substrate (47) onto a side on which the first electric wirings are formed of the

adhesive layer, and stripping the second substrate and the adhesive layer from each other (See Figures 1-25); and providing adhesive layer with openings (65, See Figures 1-25) reaching the devices, filling the openings with a conductive material (49), and forming second electric wirings (63, 64) on the adhesive layer. Hayashi et al. discloses stripping the first substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the devices from the first substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

9. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

10. Iwafuchi et al. discloses a similar device transfer method, including a specific recitation of curing the adhesive surface of the transfer substrate after devices have been transferred (column 27, lines 40-45; column 31, lines 54-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the sequence of steps taught in Iwafuchi et al. of transferring the devices prior to

heat/light curing the adhesive layer in the method of Hayashi et al. The motivation would have been to improve ease of separation between the first and second substrate. It would have been obvious to use a known sequence of device transfer to improve a similar method, by allowing for clean removal of the second substrate from the second substrate in the same way. The combination of prior art elements of a sequence of the stripping of a first substrate and curing an adhesive layer used in a device transfer method would have yielded the predictable result of transferring devices from a second substrate to a first substrate without damaging the devices.

11. As to claim 41, Hayashi et al. discloses embedding a plurality of first devices (42) arranged on a first substrate (41) into an uncured adhesive layer (45) provided on a second substrate (43) by positioning the first and second substrates in close proximity thereof such that the plurality of first devices arranged on the first substrate penetrate the surface of the uncured pressure sensitive adhesive layer (See Figures 1-25), and stripping the plurality of first devices from the first substrate thereby holding the plurality of first devices in an embedded state in the adhesive layer (See Figures 1-25); further embedding a plurality of second devices arranged on the first substrate into the uncured adhesive layer (See paragraph 0170) by positioning the first and second substrates in close proximity thereof such that the plurality of second devices arranged on the first substrate penetrate the surface of the uncured adhesive layer (See Figures 1-25), and stripping the plurality of second devices from the first substrate thereby holding the plurality of second devices (62) in an embedded state in the adhesive layer (See paragraph 0226); hardening the pressure sensitive adhesive layer to cure the adhesive

layer where the plurality of first devices and the plurality of second devices are held in the embedded and cured state within the pressure sensitive adhesive layer (See paragraph 0157); forming first electric wirings on the adhesive layer (46), adhering a third substrate (47) onto the side on which the first electric wirings are formed of the adhesive layer, and stripping the second substrate and the adhesive layer from each other (See Figures 1-25); and providing the adhesive layer with openings reaching the plurality of first devices or the plurality of second devices, filling the openings with a conductive material (49), and forming second electric wirings on the adhesive layer (63, 64, See Figure 16), wherein the first devices and second devices are light emitting diodes (See paragraph 0170). Hayashi et al. discloses stripping the first substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the plurality of second devices from the second substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

12. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory

adhesion (Nakamura et al., column 4, lines 45-53). Therefore, it would have been obvious to combine Nakamura et al. with Hayashi et al. to obtain the invention as disclosed in claim 41.

13. Iwafuchi et al. discloses a similar device transfer method, including a specific recitation of curing the adhesive surface of the transfer substrate after devices have been transferred (column 27, lines 40-45; column 31, lines 54-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the sequence of steps taught in Iwafuchi et al. of transferring the devices prior to heat/light curing the adhesive layer in the method of Hayashi et al. The motivation would have been to improve ease of separation between the first and second substrate. It would have been obvious to use a known sequence of device transfer to improve a similar method, by allowing for clean removal of the second substrate from the second substrate in the same way. The combination of prior art elements of a sequence of the stripping of a first substrate and curing an adhesive layer used in a device transfer method would have yielded the predictable result of transferring devices from a second substrate to a first substrate without damaging the devices.

14. As to claim 42, Hayashi et al. discloses the plurality of first devices and the plurality of second devices have different characteristics (See paragraph 0170).

15. As to claim 43, Hayashi et al. discloses plurality of first devices and the plurality of second devices are held in the embedded state in different areas on the second substrate (See Figures 1-25).

16. As to claim 45, Hayashi et al. discloses one of the plurality of first devices and the plurality of second devices are any one of display devices and driving circuit devices (see paragraph 0170).

17. As to claim 47, Hayashi et al. discloses bringing the plurality of second devices into contact with a temporary adhesion layer provided on the second substrate for temporarily adhering the other side devices to the temporary adhesion layer thereby arranging the devices on the second substrate, before embedding the plurality of second devices into the uncured adhesive layer provided on the first substrate (See Figures 1-25). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

18. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

19. As to claim 48, Hayashi et al. discloses a tack of the pressure sensitive adhesive layer provided on the first substrate is greater than a tack of the temporary adhesion layer provided on the second substrate, as shown by the transfer of devices from the temporary adhesion layer to the adhesive layer (See Figures 1-25). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

20. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

21. As to claim 49, Hayashi et al. discloses tack of at least one of the uncured adhesive layer and the temporary adhesion layer is changed so that the tack of the uncured adhesive layer will be greater than the tack of the temporary adhesion layer (i.e. thermally cure; See paragraph 0187). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

22. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

23. As to claim 50, Hayashi et al. discloses curing the uncured adhesive layer using a heating treatment (i.e. thermosetting; See paragraph 0187). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

24. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

25. As to claim 51, Hayashi et al. discloses the adhesive layer is hardened after stripping the devices from the first substrate (i.e. "certainly fixed"; See paragraph 0226). However, Hayashi et al. does not disclose using pressure sensitive adhesive, or the uncured adhesive layer is hardened after stripping the devices.

26. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

27. Iwafuchi et al. discloses a similar device transfer method, including a specific recitation of curing the adhesive surface of the transfer substrate after devices have been transferred (column 27, lines 40-45; column 31, lines 54-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine

the sequence of steps taught in Iwafuchi et al. of transferring the devices prior to heat/light curing the adhesive layer in the method of Hayashi et al. The motivation would have been to improve ease of separation between the first and second substrate. It would have been obvious to use a known sequence of device transfer to improve a similar method, by allowing for clean removal of the second substrate from the second substrate in the same way. The combination of prior art elements of a sequence of the stripping of a first substrate and curing an adhesive layer used in a device transfer method would have yielded the predictable result of transferring devices from a second substrate to a first substrate without damaging the devices.

28. Claims 40 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Publication No. WO02/084631 as evidenced by corresponding U.S. Patent No. 6,872,635 to Hayashi et al. in view of U.S. Patent No. 5,426,342 to Nakamura et al. and U.S. Patent No. 6,613,610 to Iwafuchi et al. as applied to claims 36, 38-39, 41-43, 45, and 47-51 above, and further in view of U.S. Patent Application Publication No. 2003/0227253 to Seo et al.

29. With respect to claim 40, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

30. Seo et al. discloses display is carried out through simple matrix driving by impressing a voltage on the devices through the first electric wirings and the second electric wirings (See paragraph 0016). It would have been obvious to one of ordinary skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to cause electroluminescence (Seo et al., See paragraph 0051).

31. As to claim 44, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

32. Seo et al. discloses display is carried out through simple matrix driving by impressing a voltage on the devices through the first electric wirings and the second electric wirings (See paragraph 0016). It would have been obvious to one of ordinary skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to cause electroluminescence (Seo et al., See paragraph 0051).

33. As to claim 46, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a

substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

34. Seo et al. discloses display is carried out through active matrix driving by impressing a voltage on the display devices by the driving circuit devices. (See paragraph 0016). It would have been obvious to one of ordinary skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to allow for drive at a low voltage (Seo et al., See paragraph 0052).

35. Claims 36, 38-39, 41-43, 45, and 47-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Publication No. WO02/084631 as evidenced by corresponding U.S. Patent No. 6,872,635 to Hayashi et al. in view of U.S. Patent No. 5,426,342 to Nakamura et al. and U.S. Patent No. 6,700,185 to Kawai et al.

36. With respect to claim 36, Hayashi et al. discloses embedding a plurality of first devices (8) into an uncured adhesive layer (7) provided on a first substrate (6); embedding a plurality of second devices (3) arranged on a second substrate into an uncured adhesive layer (7) provided on the first substrate (6) by positioning the first and second substrates in close proximity thereof such that the plurality of second devices arranged on the second substrate penetrate the surface of the uncured pressure sensitive adhesive layer (See paragraph 0126); and stripping the plurality of second devices from the first substrate thereby holding the other-side devices in an embedded

states in the uncured adhesive layer (See Figures 1-25) wherein the first devices and second devices are light emitting diodes having different characteristics (See paragraph 0170). Hayashi et al. discloses stripping the second substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the plurality of second devices from the second substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

37. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

38. Kawai et al. discloses a device adhering method, including it is known in the art of adhesive device transfer as equivalent to harden the enveloping adhesive (7) composition either before or after the temporary substrate (4) has been stripped from the devices (3; column 13, lines 25-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use either equivalent sequence of hardening the layer and stripping the temporary substrate as taught by Kawai et al. in

the method of Hayashi et al. Simple substitution of one known element (hardening the adhesive layer after stripping the temporary substrate taught by Kawai) for another (sequence of steps in Hayashi) would achieve the predictable result of removing devices from the temporary substrate onto the target substrate.

39. As to claim 38, Hayashi et al. discloses the one-side (8) devices and the plurality of first devices (3a) and the plurality of second devices are held in the embedded state in different areas on the substrate (See Figures 1-25).

40. As to claim 39, Hayashi et al. discloses embedding devices (42) arranged on a first substrate (41) into an uncured pressure sensitive adhesive layer (45) provided on a second substrate (43) by positioning the first and second substrates in close proximity thereof such that the devices arranged on the first substrate penetrate the surface of the uncured pressure sensitive adhesive layer, the pressure sensitive adhesive being in an uncured state (See Figures 1-25); wherein the devices are light emitting diodes (See paragraph 0170); stripping the devices from the first substrate thereby holding the devices in an embedded state in the pressure sensitive adhesive layer (See Figures 1-25), and hardening the uncured adhesive layer to cure the pressure sensitive adhesive (See paragraph 0226); forming first electric wirings (46) on the adhesive layer, adhering a third substrate (47) onto a side on which the first electric wirings are formed of the adhesive layer, and stripping the second substrate and the adhesive layer from each other (See Figures 1-25); and providing adhesive layer with openings (65, See Figures 1-25) reaching the devices, filling the openings with a conductive material (49), and forming second electric wirings (63, 64) on the adhesive layer. Hayashi et al. discloses

stripping the first substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the devices from the first substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

41. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

42. Kawai et al. discloses a device adhering method, including it is known in the art of adhesive device transfer as equivalent to harden the enveloping adhesive (7) composition either before or after the temporary substrate (4) has been stripped from the devices (3; column 13, lines 25-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use either equivalent sequence of hardening the layer and stripping the temporary substrate as taught by Kawai et al. in the method of Hayashi et al. Simple substitution of one known element (hardening the adhesive layer after stripping the temporary substrate taught by Kawai) for another

(sequence of steps in Hayashi) would achieve the predictable result of removing devices from the temporary substrate onto the target substrate.

43. As to claim 41, Hayashi et al. discloses embedding a plurality of first devices (42) arranged on a first substrate (41) into an uncured adhesive layer (45) provided on a second substrate (43) by positioning the first and second substrates in close proximity thereof such that the plurality of first devices arranged on the first substrate penetrate the surface of the uncured pressure sensitive adhesive layer (See Figures 1-25), and stripping the plurality of first devices from the first substrate thereby holding the plurality of first devices in an embedded state in the adhesive layer (See Figures 1-25); further embedding a plurality of second devices arranged on the first substrate into the uncured adhesive layer (See paragraph 0170) by positioning the first and second substrates in close proximity thereof such that the plurality of second devices arranged on the first substrate penetrate the surface of the uncured adhesive layer (See Figures 1-25), and stripping the plurality of second devices from the first substrate thereby holding the plurality of second devices (62) in an embedded state in the adhesive layer (See paragraph 0226); hardening the pressure sensitive adhesive layer to cure the adhesive layer where the plurality of first devices and the plurality of second devices are held in the embedded and cured state within the pressure sensitive adhesive layer (See paragraph 0157); forming first electric wirings on the adhesive layer (46), adhering a third substrate (47) onto the side on which the first electric wirings are formed of the adhesive layer, and stripping the second substrate and the adhesive layer from each other (See Figures 1-25); and providing the adhesive layer with openings reaching the

plurality of first devices or the plurality of second devices, filling the openings with a conductive material (49), and forming second electric wirings on the adhesive layer (63, 64, See Figure 16), wherein the first devices and second devices are light emitting diodes (See paragraph 0170). Hayashi et al. discloses stripping the first substrate prior to cooling the adhesive to room temperature, when the adhesive is cured completely (See paragraph 0226). However, Hayashi et al. does not specifically disclose using pressure sensitive adhesive or stripping the plurality of second devices from the second substrate while the pressure sensitive adhesive layer is in an uncured state thereby holding the plurality of first and second devices in an embedded state within the uncured pressure sensitive adhesive layer.

44. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

45. Kawai et al. discloses a device adhering method, including it is known in the art of adhesive device transfer as equivalent to harden the enveloping adhesive (7) composition either before or after the temporary substrate (4) has been stripped from the devices (3; column 13, lines 25-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use either equivalent sequence of

hardening the layer and stripping the temporary substrate as taught by Kawai et al. in the method of Hayashi et al. Simple substitution of one known element (hardening the adhesive layer after stripping the temporary substrate taught by Kawai) for another (sequence of steps in Hayashi) would achieve the predictable result of removing devices from the temporary substrate onto the target substrate.

46. As to claim 42, Hayashi et al. discloses the plurality of first devices and the plurality of second devices have different characteristics (See paragraph 0170).

47. As to claim 43, Hayashi et al. discloses plurality of first devices and the plurality of second devices are held in the embedded state in different areas on the second substrate (See Figures 1-25).

48. As to claim 45, Hayashi et al. discloses one of the plurality of first devices and the plurality of second devices are any one of display devices and driving circuit devices (see paragraph 0170).

49. As to claim 47, Hayashi et al. discloses bringing the plurality of second devices into contact with a temporary adhesion layer provided on the second substrate for temporarily adhering the other side devices to the temporary adhesion layer thereby arranging the devices on the second substrate, before embedding the plurality of second devices into the uncured adhesive layer provided on the first substrate (See Figures 1-25). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

50. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column

4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

51. As to claim 48, Hayashi et al. discloses a tack of the pressure sensitive adhesive layer provided on the first substrate is greater than a tack of the temporary adhesion layer provided on the second substrate, as shown by the transfer of devices from the temporary adhesion layer to the adhesive layer (See Figures 1-25). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

52. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

53. As to claim 49, Hayashi et al. discloses tack of at least one of the uncured adhesive layer and the temporary adhesion layer is changed so that the tack of the uncured adhesive layer will be greater than the tack of the temporary adhesion layer (i.e. thermally cure; See paragraph 0187). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

54. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

55. As to claim 50, Hayashi et al. discloses curing the uncured adhesive layer using a heating treatment (i.e. thermosetting; See paragraph 0187). However, Hayashi et al. does not disclose using pressure sensitive adhesive.

56. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

57. As to claim 51, Hayashi et al. discloses the adhesive layer is hardened after stripping the devices from the first substrate (i.e. "certainly fixed"; See paragraph 0226). However, Hayashi et al. does not disclose using pressure sensitive adhesive, or the uncured adhesive layer is hardened after stripping the devices.

58. Nakamura et al. discloses a method of manufacturing a fluorescent display device, including using a heat sensitive and pressure sensitive adhesive layer (column 4, lines 45-53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the pressure sensitive adhesive, taught by Nakamura et al., with the element transfer method disclosed by Hayashi et al. The motivation would have been to use an adhesive with good volatility and satisfactory adhesion (Nakamura et al., column 4, lines 45-53).

59. Kawai et al. discloses a device adhering method, including it is known in the art of adhesive device transfer as equivalent to harden the enveloping adhesive (7) composition either before or after the temporary substrate (4) has been stripped from the devices (3; column 13, lines 25-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use either equivalent sequence of hardening the layer and stripping the temporary substrate as taught by Kawai et al. in the method of Hayashi et al. Simple substitution of one known element (hardening the adhesive layer after stripping the temporary substrate taught by Kawai) for another (sequence of steps in Hayashi) would achieve the predictable result of removing devices from the temporary substrate onto the target substrate.

60. Claims 40 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over PCT Publication No. WO02/084631 as evidenced by corresponding U.S. Patent No. 6,872,635 to Hayashi et al. in view of U.S. Patent No. 5,426,342 to Nakamura et al. and U.S. Patent No. 6,700,185 to Kawai et al. as applied to claims 36, 38-39, 41-43, 45,

and 47-51 above, and further in view of U.S. Patent Application Publication No. 2003/0227253 to Seo et al.

61. With respect to claim 40, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

62. Seo et al. discloses display is carried out through simple matrix driving by impressing a voltage on the devices through the first electric wirings and the second electric wirings (See paragraph 0016). It would have been obvious to one of ordinary skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to cause electroluminescence (Seo et al., See paragraph 0051).

63. As to claim 44, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

64. Seo et al. discloses display is carried out through simple matrix driving by impressing a voltage on the devices through the first electric wirings and the second electric wirings (See paragraph 0016). It would have been obvious to one of ordinary

skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to cause electroluminescence (Seo et al., See paragraph 0051).

65. As to claim 46, Hayashi et al. discloses an element transfer method, including using light emitting devices as elements (See paragraph 0170). Nakamura et al. discloses the use of a pressure and heat sensitive adhesive to adhere the elements to a substrate. However, Hayashi et al. and Nakamura et al. do not disclose driving methods.

66. Seo et al. discloses display is carried out through active matrix driving by impressing a voltage on the display devices by the driving circuit devices. (See paragraph 0016). It would have been obvious to one of ordinary skill in the art to combine the driving method of Seo et al. with the element transfer method, disclosed by Hayashi et al. and the pressure sensitive adhesive taught by Nakamura et al. The motivation would have been to allow for drive at a low voltage (Seo et al., See paragraph 0052).

### ***Double Patenting***

67. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated

by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

68. Claims 36 and 38-51 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 11/467007('007) in view of PCT Publication No. WO02/084631 as evidenced by corresponding U.S. Patent No. 6,872,635 to Hayashi et al. '007 discloses a similar device transfer method as that of the currently claimed invention. '007 does not specifically disclose first and second devices. Hayashi discloses multicolor devices for producing a display capable of emitting various colors of light. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the different devices taught by Hayashi in the method of '007. The motivation would have been to produce a device capable of emitting various colors of light.

This is a provisional obviousness-type double patenting rejection.

***Response to Arguments***

69. Applicant's arguments with respect to claims 36 and 38-51 have been considered but are moot in view of the new ground(s) of rejection. Applicant's remaining arguments are addressed below:

70. As to applicant's arguments that Hayashi exclusively discloses surface bonding of devices, and does not expressly disclose embedding devices such that they penetrate an uncured adhesive layer, examiner disagrees. Applicant is directed to Figures 1-25 of Hayashi. Specifically, See Figure 10 for embedded devices that penetrate an uncured adhesive during a transfer step. Figure 11 also shows an embedded device in an uncured adhesive layer. Also See Figures 12-16 and 23-25. Applicant is reminded that specific embodiments in Hayashi are not limiting to the entire disclosure of the reference.

***Conclusion***

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY K. MCCLELLAND whose telephone number is (571)272-2372. The examiner can normally be reached on 8:00 a.m.-5 p.m. Mon-Thr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip C. Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. K. M./  
Examiner, Art Unit 1791

KKM

/Philip C Tucker/  
Supervisory Patent Examiner, Art Unit 1791